



AMENDMENTS TO THE CLAIMS

1. (currently amended) A system for bulge forming an unheated a
substantially flat blank into an article which comprises a formed part and which includes
a shaped portion, comprising:

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a form-shaping an element for enabling the shaped portions of the article to
be formed thereagainst, including a complementary portion which is complementary in
shape to the shape of the shaped portion of the article to be formed thereby;

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an enclosing enabling element means for enabling the form-shaping
element to be enclosed therein, and for enabling the unheated blank to be positioned and
enclosed therein;

A

a flexible member, adapted to be enclosed within the enclosing enabling
element means, to bulge within the enclosing enabling element means upon the
application of pressure to the flexible member, to exert pressure on the unheated blank
adapted to be positioned in the enclosing enabling element means, and to bend the
unheated blank relative to the form-shaping element complementary portion to form the
shaped portion of the article; and

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an expansion enabling element means for enabling expansion of the flexible
member so as to exert pressure on the unheated blank and form the shaped portion of the
article against the form-shaping element.

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2. (currently amended) The system of claim 1, wherein the flexible member is
further adapted to be attached within the enclosing enabling element means.

3. (currently amended) The system of claim 1, wherein the flexible member is

It further adapted to be movable within the enclosing enabling element means.

4. (original) The system of claim 1, wherein the flexible member comprises a

It bladder.

5. (original) The system of claim 1, wherein the form-shaping element

It comprises a die element.

6. (currently amended) The system of claim 1, wherein the enclosing

A enabling element means comprises a plurality of inter-engagable cage sections, adapted to be secured together to enable the article shaped portion to be formed therein, and to be separated to enable the unheated blank to be inserted therein or to enable removal of the *O* article formed therein.

7. (currently amended) The system of claim 1, wherein the expansion

It enabling element means comprises a pumping ¹² enabling element means for enabling a medium for exerting pressure on the flexible member to be pumped therethrough into the flexible member for expansion of the flexible member.

8. (currently amended) The system of claim 1, wherein the unheated blank is

It comprised of sheet metal.

9. (original) The system of claim 1, further comprising a plurality of form-

O shaping elements, and a plurality of flexible members.

It? 103
relative portion is to be bulge formed comprises a substantially large article.

It 11. (original) The system of claim 1, wherein the article further comprises a finished part.

It relative 12. (original) The system of claim 1, wherein the article is comprised of lightweight material.

It 13. (original) The system of claim 1, wherein the article comprises a complex shaped article, which includes a plurality of shaped portions.

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It 14. (original) The system of claim 4, wherein the bladder is comprised of rubber.

It 103 15. (original) The system of claim 4, wherein the bladder is comprised of polyurethane.

It 16. (currently amended) The system of claim 7, wherein the pumping enabling element means includes a tube, adapted to be connected to the flexible member.

It 103 17. (original) The system of claim 7, wherein the pressure-exerting medium comprises hydraulic fluid.

It 103 obvious 18. (currently amended) The system of claim 8, wherein the unheated sheet metal blank is comprised of aluminum.

It treat 19. (original) The system of claim 10, wherein the article comprises an

claiming aircraft fuselage crown frame.

tool not product

20. (original) The system of claim 10, wherein the article to be formed thereby

|| further comprises a thin-walled article.

21. (original) The system of claim 10, wherein the article to be formed thereby

|| further comprises a structural article.

22. (currently amended) The system of claim 10, wherein the unheated blank

*|| to be formed into the article is substantially large corresponding to the substantially large
(article.*

A 23. (currently amended) The system of claim 10, wherein the enclosing

*It relative
+ treat* enabling element means, the form shaping element, and the flexible member are
substantially large corresponding to the substantially large article.

inherent 24. (original) The system of claim 16, wherein the tube comprises a flexible

It tube.

25. (currently amended) A system for bulge forming an unheated a
substantially flat blank into an article which comprises a formed part and which includes
a shaped portion, comprising:

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a form-shaping means element for enabling the shaped portions of the
article to be formed there against, including a complementary portion which is

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complementary in shape to the shape of the shaped portion of the article to be formed thereby;

9
an enclosing enabling means element for enabling the form-shaping means element to be enclosed therein, and for enabling the unheated blank to be positioned and enclosed therein;

A
a flexible member, adapted to be enclosed within the enclosing enabling means, to bulge within the enclosing enabling means element upon the application of pressure to the flexible member, to exert pressure on the unheated blank adapted to be positioned in the enclosing enabling means element, and to bend the unheated blank relative to the form-shaping element complementary portion to form the shaped portion of the article; and

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an expansion enabling means element for enabling expansion of the flexible member so as to exert pressure on the unheated blank and form the shaped portion of the article against the form-shaping element.

It
26. (currently amended) The system of claim 25, wherein the flexible member is further adapted to be attached within the enclosing enabling means element.

It
27. (currently amended) The system of claim 25, wherein the flexible member is further adapted to be movable within the enclosing enabling means element.

It
28. (original) The system of claim 25, wherein the flexible member comprises a bladder.

If
29. (original) The system of claim 25, wherein the form-shaping element comprises a die element.

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30. (currently amended) The system of claim 25, wherein the enclosing enabling means comprise element comprises a plurality of inter-engagable cage sections, adapted to be secured together to enable the article shaped portion to be formed therein, and to be separated to enable the unheated blank to be inserted therein or to enable removal of the article formed therein.

If
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31. (currently amended) The system of claim 25, wherein the expansion enabling means comprise element comprises pumping enabling means ¹² an element for enabling a medium for exerting pressure on the flexible member to be pumped therethrough into the flexible member for expansion of the flexible member.

If
32. (currently amended) The system of claim 25, wherein the unheated blank is comprised of sheet metal.

Ob
33. (original) The system of claim 25, further comprising a plurality of form-shaping elements, and a plurality of flexible members.

tract
It
34. (original) The system of claim 25, wherein the article in which a shaped portion is to be bulge formed comprises a substantially large article.

tract
It
35. (original) The system of claim 25, wherein the article further comprises a finished part.

+ rear
5f 36. (original) The system of claim 25, wherein the article is comprised of

lightweight material.

+ rear
IT 37. (original) The system of claim 25, wherein the article comprises a complex

shaped article, which includes a plurality of shaped portions.

+ rear
103 38. (original) The system of claim 28, wherein the bladder is comprised of

rubber.

+ rear
103 39. (original) The system of claim 28, wherein the bladder is comprised of

polyurethane.

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IT 40. (currently amended) The system of claim 31, wherein the pumping

enabling means include element includes a tube, adapted to be connected to the flexible member.

103 + rear
41. (original) The system of claim 31, wherein the pressure-exerting medium

comprises hydraulic fluid.

+ rear
IT 42. (currently amended) The system of claim 32, wherein the sheet metal

+ rear unheated blank is comprised of aluminum.

+ rear
IT 43. (original) The system of claim 34, wherein the article comprises an aircraft

fuselage crown frame.

treat 44. (original) The system of claim 34, wherein the article to be formed thereby

If further comprises a thin-walled article.

treat 45. (original) The system of claim 34, wherein the article to be formed thereby

If further comprises a structural article.

treat 46. (currently amended) The system of claim 34, wherein the unheated blank

rent *It* sheet metal to be formed into the article is substantially large corresponding to the substantially large article.

treat 47. (original) The system of claim 34, wherein the enclosing enabling means,

Cl *treat* the form-shaping element, and the flexible member are substantially large corresponding

It to the substantially large article.

treat 48. (original) The system of claim 40, wherein the tube comprises a flexible

It tube.

method

49. (currently amended) A method of bulge forming an unheated a

substantially flat blank into an article which comprises a formed part and which includes

a shaped portion, in a system which comprises a form-shaping ~~an~~ element for enabling

the shaped portions of the article to be formed thereagainst, including a complementary

portion which is complementary in shape to the shape of the shaped portion of the article

to be formed thereby, an enclosing enabling element ~~means~~ for enabling the form-

shaping element to be enclosed therein, and for enabling the unheated blank to be

positioned and enclosed therein, a flexible member, adapted to be enclosed within the

enclosing enabling element means, to bulge within the enclosing enabling means upon the application of pressure to the flexible member, to exert pressure on the unheated blank adapted to be positioned in the enclosing enabling element means, and to bend the unheated blank relative to the form-shaping element complementary portions to form the shaped portion of the article, and an expansion enabling element means for enabling expansion of the flexible member so as to exert pressure on the unheated blank and form the shaped portion of the article against the form-shaping element, wherein the method comprises:

- A opening the enclosing enabling element means and positioning the unheated blank therein relative to the form-shaping element;
- B closing the enclosing enabling element means; and
- C expanding the flexible member such that the flexible member bulges relative to the unheated blank and exerts pressure on the unheated blank against the form-shaping enabling element to form the shaped portion of the article.

50. (currently amended) The method of claim 49, wherein the flexible member is further adapted to be attached within the enclosing enabling element means, and wherein expanding comprises exerting pressure from the attached flexible member within the enclosing enabling element means.

It
51. (currently amended) The method of claim 49, wherein the flexible member is further adapted to be movable within the enclosing enabling element means, and wherein expanding comprises exerting pressure from the moveable flexible member within the enclosing enabling element means.

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52. (original) The method of claim 49, wherein the flexible member comprises a bladder, and wherein expanding comprises expanding the bladder.

a *it*
53. (original) The method of claim 49, wherein the form-shaping element comprises a die element, and wherein expanding comprises expanding the flexible member against the die element.

Ob
54. (currently amended) The method of claim 49, wherein the enclosing enabling element means comprises a plurality of inter-engagable cage sections, adapted to be secured together to enable the article shaped portion to be formed therein, and to be separated to enable the unheated blank to be inserted therein or to enable removal formed therein, and wherein closing the enclosing enabling element means comprises engaging together the sections of the enclosing enabling element means.

55. (currently amended) The method of claim 49, wherein the expansion
enabling element means comprises a pumping enabling element means for enabling a
medium for exerting pressure in the flexible member to be pumped therethrough into the
It flexible member for expansion of the flexible member, and wherein expanding comprises
enabling the pressure exerting medium to be pumped through the pumping enabling
element means into the flexible member for expansion of the flexible member.

56. (currently amended) The method of claim 49, wherein the unheated blank
~~it~~ is comprised of sheet metal, and wherein expanding comprises expanding the flexible
member against the unheated sheet metal blank.

57. (original) The method of claim 49, further comprising a plurality of form-
shaping elements, and a plurality of flexible members, and wherein expanding comprises
It expanding the plurality of flexible members against the plurality of form-shaping
elements.
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58. (original) The method of claim 49, wherein the article in which a shaped
treat portion is to be bulge formed comprises a substantially large article, and wherein
It expanding further comprises forming the substantially large article.

59. (original) The method of claim 49, wherein the article further comprises a
It finished part, and wherein expanding further comprises forming the finished part.

60. (original) The method of claim 49, wherein the article is lightweight, and
wherein expanding further comprises forming the lightweight article.

IFT 61. (original) The method of claim 49, wherein the article comprises a complex shaped article which includes a plurality of shaped portions, and wherein expanding further comprises forming the complex shaped article.

103 62. (original) The method of claim 52, wherein the bladder is comprised of rubber, and wherein expanding comprises expanding the rubber bladder.

103 63. (original) The method of claim 52, wherein the bladder is comprised of polyurethane, and wherein expanding comprises expanding the polyurethane bladder.

12 64. (currently amended) The method of claim 55, wherein the pumping enabling element means includes a tube, adapted to be connected to the flexible member, *CT* and wherein expanding comprises enabling the pressure-exerting medium to be pumped through the tube into the flexible member.

103 65. (original) The method of claim 55, wherein the pressure-exerting medium comprises hydraulic fluid, and wherein expanding comprises enabling hydraulic fluid to be pumped through the pumping enabling means into the flexible member for expansion of the flexible member.

103 66. (currently amended) The system of claim 56, wherein the unheated sheet metal blank is comprised of aluminum, and wherein expanding comprises expanding the flexible member against the unheated aluminum blank.

67. (original) The method of claim 58, wherein the article comprises an aircraft fuselage crown frame, and wherein expanding further comprises forming the aircraft fuselage crown frame.

68. (original) The method of claim 58, wherein the article to be formed thereby further comprises a thin-walled article, and wherein expanding further comprises forming the thin-walled article.

69. (original) The method of claim 58, wherein the article to be formed thereby further comprises a structural article, and wherein expanding further comprises forming the structural article.

70. (currently amended) The method of claim 58, wherein the unheated blank to be formed into the article is substantially large corresponding to the substantially large article, and wherein expanding further comprises exerting pressure on the substantially large unheated blank.

71. (currently amended) The method of claim 58, wherein the enclosing enabling element means, the form-shaping element, and the flexible member are substantially large corresponding to the substantially large article, and wherein opening further comprises opening the substantially large enclosing enabling element means and positioning the unheated blank relative to the substantially large form-shaping element, and expanding further comprises expanding the substantially large flexible member.

72. (original) The method of claim 64, wherein the tube comprises a flexible

~~inherent~~
~~It~~ tube, and expanding comprises enabling the pressure-exerting medium to be pumped through the flexible tube.

73. (new) A method of bulge forming an unheated substantially flat blank into an article which comprises a formed part and which includes a shaped portion, in a system which comprises form-shaping means for enabling the shaped portions of the article to be formed thereagainst, including a complementary portion which is complementary in shape to the shape of the shaped portion of the article to be formed thereby, enclosing enabling means for enabling the form-shaping means to be enclosed therein, and for enabling the unheated blank to be positioned and enclosed therein, a flexible member, adapted to be enclosed within the enclosing enabling means, to bulge within the enclosing enabling means upon the application of pressure to the flexible member, to exert pressure on the unheated blank adapted to be positioned in the enclosing enabling means, and to bend the unheated blank relative to the form-shaping element complementary portions to form the shaped portion of the article, and expansion enabling means for enabling expansion of the flexible member so as to exert pressure on the unheated blank and form the shaped portion of the article against the form-shaping means, wherein the method comprises:

opening the enclosing enabling means and positioning the unheated blank therein relative to the form-shaping means;

closing the enclosing enabling means; and

expanding the flexible member such that the flexible member bulges

It relative to the unheated blank and exerts pressure on the unheated blank against the form-shaping means to form the shaped portion of the article.

It 74. (new) The system of claim 7, wherein the pressure exerting medium is

treat adapted to exert substantially high pressure.